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ABSTRACT

Given that the subject matter of geography is commonly viewed as lacking definite character, form, and organization, this study was initiated as an attempt to evaluate the nature of the images high school students possess concerning the discipline of geography. Acquiring knowledge of these images is prerequisite to curriculum improvement attempts. A 30 item, Likert-type scale was given to 694 students in 15 Nebraska high schools. The items were constructed to ascertain the knowledge which students possessed about the subject-matter of geography, the value students placed upon geography, and their perceptions of the way geography is taught. When the mean score for each item was calculated it was found that most of the means clustered around the neutral point of 3.00. Since the means revealed little about the complexities of the interrelationships among the statements, a reduction of the statements was sought through principal component analysis. Five factors resulted but only one accounted for more than five percent of the common variance. The results suggest that high school images of geography, while they can be tentatively identified as being positive, nevertheless appear to be rather weakly formulated. Perhaps additional effort is required to convey the impression of a coherent geography discipline. (Author/BC)

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HIGH SCHOOL IMAGES OF GEOGRAPHY: A SEARCH FOR INTERPRETATION

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Almost since its inception as a high school and college subject geography has been plagued with the problem of justifying its existence as a bonafide member among academic disciplines.[1] Accompanying this problem, "inferiority complexes" have developed among many geographers. A plausible hypothesis for this state of affairs must surely emanate from the observation that the subject matter with which geography is principally concerned is virtually unbounded. This feature of geography may be viewed as both a virtue and a vice. On the one hand, the discipline is readily able to accommodate a diverse perspective on both teaching and research interest; on the other hand, the nature of the subject matter is frequently viewed as being unduly amorphous. For many individuals, it is this latter point which often proves to be the most burdensome. Thus, for example, a commonly held viewpoint is that geography consists of those fractions of the physical and human sciences which somehow do not fully belong to their respective fields. The end result is that these "hybrids" have (often uncomfortably) been assimilated beneath the umbrella of geography. To say the least, this characterization of geography presents enormous difficulties when attempting to "define" exactly what it is that geographers deal with, a situation which has witnessed previous accolades, such as: "Geography is what geographers do." Numerous reasons are then advanced supporting the credibility and usefulness of geography as an independent discipline with positive contributions of both an academic and practical nature. Such contributions are not disputed by the authors of this paper.

It would appear, however, that a definite need exists to present geography to people both within, and especially outside of, the discipline from a favorable perspective. To a large extent, a person's impressions regarding geography seem to be nurtured and developed at the pre-college level. Most geographers, when discussing their discipline with non-geographers, discover that the popular conception of geography is rather narrowly based. Usually, this "image" of the field is concerned with place-name memorization and simple descriptions of the earth's regions. When questioned about this orientation, it appears that a student's

pre- and high school training in geography significantly influences his lasting impression of the field. Thus, even in introductory courses offered at the university level, it was found that many students were dissatisfied with innovative courses and would have preferred a more traditional world regional approach. This feeling was particularly pronounced among those students from Colleges of Education, and these are the individuals who are therefore more likely to perpetuate the "traditional" image of geography to high school students.[2] This particular situation has led to the suggestion that, "It might be in the long run improvement of college geography to study student outcomes across a wide range of beginning courses in terms of beliefs and feelings about geography."[3]

Statements such as those alluded to above suggest that it is extremely important to examine the nature of the images which pre-college students formulate about geography. As Carswell has noted,

> ".....we need to measure attitudes as well as knowledge [about geography because] the likelihood that a student will use his knowledge of geography is influenced by his attitude toward the subject."[4]

In view of the foregoing comments, the major aim of this paper is to attempt to evaluate the "images" which high school students possess concerning the discipline of geography. More specifically, do students consider geography as being of intrinsic value as a conceptual discipline, or is it nothing more than memorizing and regurgitating a lot of facts? Does geography possess any practical utility? Will geography aid the student by providing insights concerning the world around him? Do students view geography as a "snap" course? Is geography a discipline considered to be worthwhile pursuing at the college level? In view of the heterogeneous nature of the field, are students capable of defining the subject matter with which geography deals?

It is hoped that answers to at least some of these questions are provided in this study. However, it is emphasized at the outset that research of this nature is suggestive rather than definitive.

THE RESEARCH DESIGN

In an effort to gauge student's attitudes or images of geography, a Likert-type scale was employed (Table 1).[5] The first ten of the thirty statements were constructed to ascertain the knowledge which students possessed about the subject-matter of geography, that is, what is geography primarily concerned with? The remaining twenty statements were designed to elicit responses which would hopefully provide insights about the images the students possessed of geography--its utility or value as well as the way in which it was taught. Presumably, the students' images of geography would be affected by the manner in which the subject-matter was handled, and thus images and teaching might be expected to be highly interrelated.

The thirty statements were presented to the students in a random order, and were scored such that a value of five was regarded as "favorable to geography" and a value of one as "unfavorable to geography." Such a procedure insured that scoring was consistent.

TABLE 1. LIKERT-TYPE SCALE FOR IMAGES OF GEOGRAPHY

Background Information

Age____. Sex: M F I am in the 8 9 10 11 12 grade.

For each of the following statements indicate your own degree of agreement or disagreement by circling one of the following alternatives: SA (strongly agree); A (agree); ? (neutral or cannot say); D (disagree); SD (strongly disagree).

Example Statement:
SA A ? D SD Big Red will be No. 1 next season.

* K	5 SA A ? D SD 1	1.	Drawing maps is what geography is all about.
K	5 SA A ? D SD 1	2.	Geography is mainly concerned with physical features.
K	5 SA A ? D SD 1	3.	Geography deals with the stories of people who travel in foreign lands.
K	5 SA A ? D SD 1	4.	Knowing about different regions is the most important part of geography
K	1 SA A ? D SD 5	5.	Geography is nothing more than memorizing the countries and their capital cities.
K	1 SA A ? D SD 5	6.	Cities are of no concern to geographers.
K	5 SA A ? D SD 1	7.	Geography is all about people around the world.
K	5 SA A ? D SD 1	8.	Geography is the study of man's adapting to his physical environment.
K	5 SA A ? D SD 1	9.	Geography's primary interest is explaining the location of things.
K	5 SA A ? D SD 1	10.	The study of "man" and geography are two words for the same thing.
T	1 SA A ? D SD 5	11.	Geography should not be taught in high schools.
T	1 SA A ? D SD 5	12.	Geography does not teach anything useful.
T	5 SA A ? D SD 1	13.	Geography should be a required subject for high school graduation
T	5 SA A ? D SD 1	14.	Geography should be given more emphasis in high schools.
T	1 SA A ? D SD 5	15.	Geography courses are poorly organized.
T	5 SA A ? D SD 1	16.	Geography should use more visual aids.
T	5 SA A ? D SD 1	17.	Geography teachers are good teachers.
T	1 SA A ? D SD 5	18.	Geography courses cover too many different things.
A	1 SA A ? D SD 5	19.	Geography is a boring subject.
A	5 SA A ? D SD 1	20.	Geography is interesting.
A	5 SA A ? D SD 1	21.	Geography is a "fun" course.
A	1 SA A ? D SD 1	22.	Geography is not a science.
A	5 SA A ? D SD 1	23.	Geography is a conceptual subject.
A	5 SA A ? D SD 1	24.	Geography is a logical subject.
A	5 SA A ? D SD 1	25.	Geography would be a useful college major.
A	5 SA A ? D SD 1	26.	Geography is an easy subject.
A	5 SA A ? D SD 1	27.	Geography is helpful in understanding current affairs.
A	1 SA A ? D SD 5	28.	Knowing about geography will not help get a job.
A	5 SA A ? D SD 1	29.	Geography can be used to help solve the ecology crisis.
A	1 SA A ? D SD 5	30.	Geography is nothing more than learning a bunch of facts.

* For first column: K = knowledge, T = teaching, A = attitude.
1 - 5 or 5 - 1 represents the way in which the items were scored.

A total of fifteen high schools (five urban and 10 rural) in Nebraska were involved in this study (Table 2) and were chosen to reflect a reasonable degree of geographic dispersion throughout the state. (Figure 1) It should be noted, however, that areal random sampling methods were not employed in the selection of the schools. The results presented are therefore based on 694 completed responses to the schedules made by students in grades nine through twelve, and were obtained during the spring semester of 1972.

The following discussion attempts to supply the rationale underlying the reasons for including the statements in the schedule, while simultaneously providing a review of some of the pertinent literature related to this research project.

KNOWLEDGE, TEACHING, AND ATTITUDES

Carswell proposes that, "There seem to be at least three categories of attitudinal information that would be of use to us. These are (1) attitudes toward geography as a subject, (2) internalization of attitudes geographers hold, and (3) attitudes toward the substantive content of geography courses. . ."[6]

Carswell's third point is discussed first. In the present study, attitudes toward the substantive content of geography hopefully would be elicited by the first ten statements. These statements were specifically included in order to uncover what the students considered to be the subject matter of geography. Many of these statements relate to the popular image of geography, such as schedule statements one, two, three, four, and five, where geography is perceived as consisting of a "bunch of facts." However, it generally is believed that a certain amount of basic factual data should be presented to the students. The need for these data is readily apparent from the independent studies conducted by Bengston and Williams.[7] In a project involving 932 eleventh and twelfth graders studying American history from thirty-six high schools in Nebraska, Bengston discovered that the average student could only correctly answer approximately one-third of the sixty-five questions given to him.[8] A lack of basic knowledge

TABLE 2. NUMBER OF RESPONSES FROM EACH SCHOOL.

High School	Number of Responses	Cumulated Number of Responses
Lincoln East	43	43
Lincoln Northeast	33	76
Lincoln Southeast	51	127
Omaha-Nathan Hale	49	176
Omaha-Morton	50	226
Arlington	49	275
Auburn	47	322
David City	45	367
Elgin	25	392
Fairbury	49	441
Loup City	50	491
Minden	51	542
O'Neill	53	595
Scottsbluff	50	645
Wymore	49	694

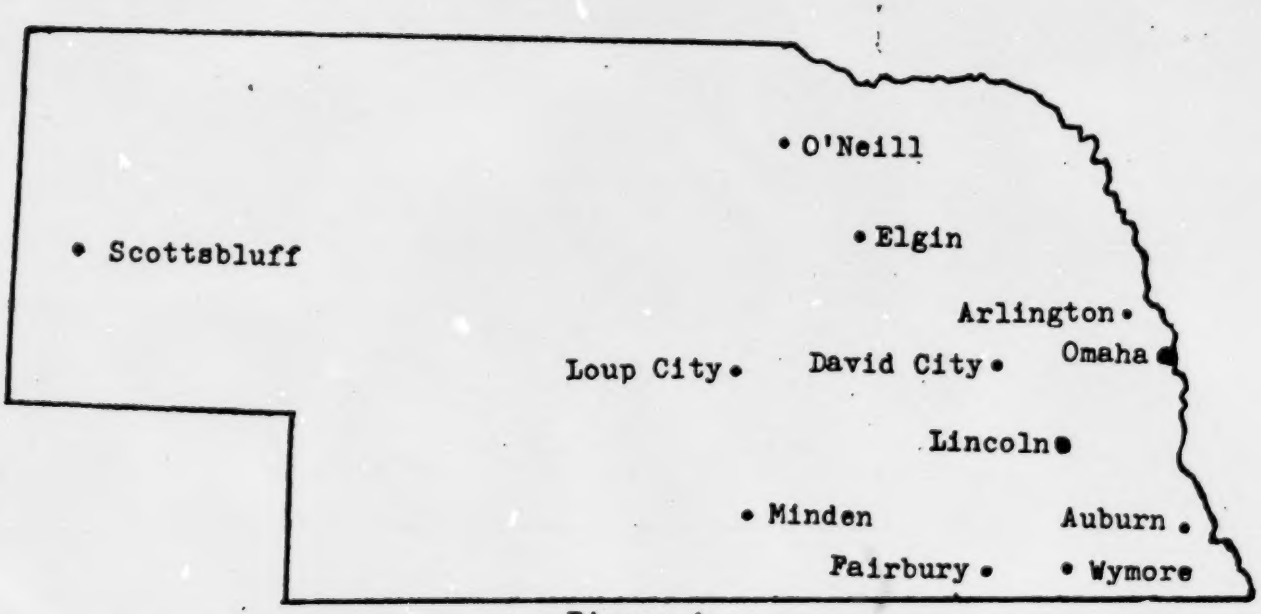

Figure 1

concerning place-names was reported by Williams, who found that university students frequently could not correctly name the states on a blank outline map consisting of the forty-eight continguous states. Indeed, for some thirteen universities spanning the country, the average total percentage of error was 28.8 percent.[9] Clearly, it would seem that if factual place-name type of information is lacking at the introductory college level, then high-schools should provide some of this information. However, it would also seem to suggest that such information should be presented within a more conceptual type of framework than has traditionally been the case since apparently unrelated "facts" are rapidly lost from memory. As one observer has noted,

> "Few important understandings were acquired by youngsters who came to feel that the study of geography required little more than the memorization of seemingly unimportant lists of places and products. Certainly such exercises offered little intellectual challenge."[10]

Aside from factual information it was felt necessary to include in the schedule statements expressing the nature of the domain with which geographers are concerned. Thus, students should be made aware that geography is a discipline attempting to explain the location of various kinds of phenomena, asking the question "why there?" rather than "where?"[11] Again, students should be cognizant of the fact that geography devotes much attention to the relationships and interaction between man and his physical environment[12] (see statements seven, nine, and eight, respectively). It has been indicated with reference to geography that,

> The base of the hierarchy consists of a great variety of knowledge objectives from knowledge of very specific information, uch as naming state capitals, to knowledge of generalizations and concepts, such as influences on the locations of cities and cultural diffusion. This lowest level of objectives puts considerable emphasis on students recalling or remembering facts, terms and generalizations. Most of the questions in achievement tests measure this type of objective.
>
> The committee implied that teachers should place their emphasis on the development of higher level cognitive abilities. Above the level of remembering knowledge, in ascending order of complexity, are the abilities of comprehension, application, analysis, and evaluation.[13]

Thus, once a student acquires a reasonable grasp of the variables which geographers study and of the interrelationships among them, he is in a better position to evaluate the nature and utility of geography as a subject. In other words the student formulates an image about geography. It is important to note, however, that there is no direct correlation between an increase of subject area knowledge and an increase in positive attitudes toward that subject area.[14] Therefore, it is possible that students might possess a meager knowledge about geography, yet, at the same time express a favorable attitude toward it, and vice versa. Nevertheless, it seems reasonable to assume that a greater knowledge and familiarity with a subject places the individual in a position in which he is better able to make a rational decision as to his impressions of that discipline, whether positive or negative.

In order to gauge students' images of the nature and use of geography, twelve statements consisting of both positive and negative affect (statements 19 through 30) were included in the schedule. Some of the "favorable to geography" statements were related to the desire to present geography as a conceptual subject--one of the aims of the High School Geography Project.[15] (Specifically, see statements 23 and 24.) Statements about the practical utility of geography were also included (statements 27 and 29).[16] Again, practical considerations are put forward in statement 25, while the stimulating aspects of geography are hinted at in items 20, 21, and 26.

Statements with negative affect also relate to the non-stimulating (number 18) and the non-conceptual nature of the discipline (numbers 22 and 30). Statement 28 refers to the non-practical aspect of geography.

Finally, the third set of items about geography were those connected with the manner in which the subject is taught. It appears plausible to hypothesize that the students' images of geography are not only shaped by the subject matter itself, but also by the way in which this information is communicated from teacher to student. Consequently, items 15, 16 and 17 were incorporated to tap the

students' impressions of how geography is taught. Also, in response to pleas for more geography in high school curriculums where there was a lack of geographical awareness possessed by many students, statements 11, 12, 13, and 14 were included in the schedule.[17]

It was hoped, therefore, that the inclusion of statements relating to the students' knowledge of and attitudes about geography and ones relating to the way in which the subject was taught would provide some means of estimating the image of geography.

MEAN SCORES ON IMAGES OF GEOGRAPHY

It was previously mentioned that the scoring procedure was such that for every statement which was "favorable to geography," a value of five on the five-point scale would be assigned, and for every statement which was "unfavorable to geography," a value of one would be assigned. Consequently, one would hope that for the majority of the statements, the average scores would approach a value of five. However, it should be noted that for some of the items concerning "knowledge" about geography, such as numbers one, two, and three, a score some distance away from five would be preferable. This preference is mentioned because the statements are only partially true, and while one would expect students to agree with them, one would also hope that this agreement would not be very strong.

The mean score for each of the statements from the 694 students is presented in Table 3. It may be useful if one compares the scores in Table 3 with the neutral value of 3.00. Those scores above 3.00 are then seen as being "favorable to geography," and vice versa. Only seven of the thirty statements had scores below 3.00, and three of these (one, two, and three) occurred on those "knowledge" variables which are only partly true. This situation suggests some degree of discrimination on the part of students about "what geography studies." On the other hand, knowledge statements which should have had scores very close to 5.00

were numbers nine (3.0072) and eight (3.5101), which were concerned, respectively, with explanation of locations and man's adaptation to his physical environment. Note, however, that item five (4.1297, the second highest score of all) relating to the memorization of countries and capital cities, does indeed demonstrate that students possess the ability to differentiate, at least partially, between the core of geographical analysis and its more peripheral concerns (this is supported by the preceding comments regarding statements one, two, and three). For the most part, therefore, the students appear to discriminate reasonably well concerning the appropriateness of geographical subject matter.

Two of the four remaining scores below 3.00 are statements 13 and 14, which reveal that students do not think that geography should be required in order to graduate from high school, nor should it be given any further emphasis in high schools. The other two scores, for statements 21 and 26, purport that geography is neither a particularly "fun" course, nor is it easy. This indicates a general indifference toward these topics, though it is conceded that these items are somewhat ambiguous in meaning.

Only three statements achieved a mean score of greater than 4.00. One of these (statement 5) has been mentioned above; the other concerns the fact that geographers are indeed interested in cities, and that they teach useful subject matter. For the most part, however, the mean scores cluster around the neutral point of 3.00.[18]

While Table 3 gives some useful summary information on the images which high school students hold about geography, it reveals little about the complexities of the interrelationships among the statements. An attempt to study such interrelationships follows.

EVALUATING IMAGE DIMENSIONS: THE USE OF PRINCIPAL COMPONENT ANALYSIS

In view of the obvious complexities involved in attempting to evaluate the images of goegraphy from thirty average scores, it was necessary to extend the

TABLE 3. MEAN SCORE ON THIRTY ITEMS ON THE IMAGE OF GEOGRAPHY.

Statement	Class of Statement *	Mean Score
1. Drawing maps is what geography is all about.	K	2.2190
2. Geography is mainly concerned with physical features.	K	2.8818
3. Geography deals with the stories of people who travel in foreign lands.	K	2.5620
4. Knowing about different regions is the most important part of geography.	K	3.3112
5. Geography is nothing more than memorizing the countries and their capital cities.	K	4.1297
6. Cities are of no concern to geographers.	K	4.0403
7. Geography is all about people around the world.	K	3.5476
8. Geography is the study of man's adapting to his physical environment.	K	3.5101
9. Geography's primary interest is in explaining the location of things.	K	3.0072
10. The study of "man" and geography are two words for the same thing.	K	3.3156
11. Geography should not be taught in high schools.	T	3.8545
12. Geography does not teach anything useful.	T	4.1354
13. Geography should be a required subject for high school graduation.	T	2.7118
14. Geography should be given more emphasis in high school.	T	2.7651
15. Geography courses are poorly organized.	T	3.5447
16. Geography should use more visual aids.	T	3.4784
17. Geography teachers are good teachers	T	3.2363
18. Geography courses cover too many different things.	T	3.1686
19. Geography is a boring subject.	A	3.1960
20. Geography is interesting.	A	3.2997
21. Geography is a "fun" course.	A	2.9280
22. Geography is not a science.	A	3.2205
23. Geography is a conceptual subject.	A	3.1657
24. Geography is a logical subject.	A	3.7536
25. Geography would be a useful college major.	A	3.1902
26. Geography is an easy subject.	A	2.7406
27. Geography is helpful in understanding current affairs.	A	3.8530
28. Knowing about geography will not help to get a job.	A	3.5159
29. Geography can be used to help solve the ecology crisis.	A	3.4582
30. Geography is nothing more than learning a bunch of facts.	A	3.5072

*K = knowledge, T = teaching, A = attitude.

analysis of images beyond this level. In an effort to achieve parsimony, it was decided to break down the thirty existing variables by means of principal component analysis. Throughout this paper it has been stressed that "images" of geography derive from the interaction of statements (variables) relating to "knowledge," teaching methods, and attitudes about the nature, scope, and utility of geography. The thirty statements were assigned in an a priori manner to each of these groups. However, do these groups exist in the minds of the students? Are the relationships subjectively postulated in this paper in fact borne out by an analysis of the data? Is it possible to derive groups of statements which collectively constitute meaningful constructs or concepts which aid in the interpretation of images of geography? In sum, can the variation among the thirty statements be accounted for in terms of a smaller number of intelligble factors?

The principal component model was selected in an effort to collapse the thirty existing statements into a smaller, and therefore more manageable, number of components describing and accounting for the relationships and variations in high school students' images of geography. Alternatively expressed, this particular model was employed in order to test the hypothesis that images of geography are composed of three fundamental groups of variables relating to (1) knowledge about the subject matter of geography, (2) teaching of geography, and (3) attitudes about geography.

The result of the components analysis with varimax rotation was the extraction of five components accounting for 47.5 percent of the common variance in the data. The variables loading on each component (selected arbitrarily, through somewhat conventionally, at $\pm$ 0.400), the percentage variance each component accounts for, and the eigenvalue associated with it are indicated in Table 4. Only five components were extracted in this analysis.[19]

INTERPRETATION OF COMPONENTS

Component 1, which accounts for almost thirty percent of the common variance in the data, consists of five "attitude" statements and three "teaching"

TABLE 4. COMPONENTS OF THE IMAGE OF GEOGRAPHY HELD BY NEBRASKA HIGH SCHOOL STUDENTS.

COMPONENT 1 (Education-Curriculum)

Variable (Statement)	Class of Statement *	Loading
21. Geography is a "fun" course.	A	.70365
19. Geography is a boring subject.	A	.70001
20. Geography is interesting.	A	.69416
26. Geography is an easy subject.	A	.49349
30. Geography is nothing more than learning a bunch of facts.	A	.48962
18. Geography courses cover too many different things.	T	.48954
15. Geography courses are poorly organized.	T	.42414
17. Geography teachers are good teachers.	T	.40367

Component 1 accounts for 29.8 percent of the common variance.

Eigenvalue = 8.92929.

COMPONENT 2 (Knowledge of Subject Matter)

Variable (Statement)	Class of Statement *	Loading
9. Geography's primary interest is in explaining the location of things.	K	.55184
2. Geography is mainly concerned with physical features.	K	.49265
10. The study of "man" and geography are two words for the same thing.	K	.48813
7. Geography is all about people around the world.	K	.46619
1. Drawing maps is what geography is all about.	K	.45457
3. Geography deals with the stories of people who travel in foreign lands.	K	.44203
6. Cities are of no concern to geographers.	K	.43564
5. Geography is nothing more than memorizing the countries and their capital cities.	K	.40087
4. Knowing about different regions is the most important part of geography.	K	.39003
8. Geography is the study of man's adapting to his physical environment.	K	.39094

Component 2 accounts for 6.5 percent of the common variance.

Eigenvalue = 1.93613.

TABLE 4 (cont.)

COMPONENT 3

Variable (Statement)	Class of Statement *	Loading
12. Geography does not teach anything useful.	T	.67995
11. Geography should not be taught in high schools.	T	.55209
24. Geography is a logical subject.	A	.42368

Component 3 accounts for 4.1 percent of the common variance.

Eigenvalue = 1.22303.

COMPONENT 4 (Education-Curriculum)

Variable (Statement)	Class of Statement *	Loading
25. Geography would be a useful college major.	A	.54130
13. Geography should be a required subject for high school graduation.	T	.49010
14. Geography should be given more emphasis in high schools.	T	.44207

Component 4 accounts for 3.7 percent of the common variance.

Eigenvalue = 1.10626.

COMPONENT 5 (Ecology)

Variable (Statement)	Class of Statement *	Loading
8. Geography is the study of man's adapting to his physical environment.	K	.44299
29. Geography can be used to help solve the ecology crisis.	A	.39693

Component 5 accounts for 3.5 percent of the common variance.

Eigenvalue = 1.04772.

*K = knowledge, T = teaching, A = attitude.

statements, thereby lending some credence to the point made earlier that images of geography might be expected to be significantly correlated with the way in which the course is taught. Basically, this component reveals that students harbor a positive feeling about the nature of characteristics of geography. The responses are typically favorable toward the discipline; for example, geography is not perceived as a boring subject, quite the converse in fact (see statements nineteen and twenty). Again, students view the material as involving considerably more than memorizing and regurgitating a bunch of facts (statements thirty and eighteen); actually, they tend to regard it as a challenging endeavor (statement twenty-six) which is appreciably communicated via well-organized and efficient personnel (statements fifteen and seventeen). In short, component 1 may be labeled as an "education - curriculum" dimension. Nevertheless, it was anticipated that some of these statements would have had higher loadings than they in fact received, and this perhaps reflects some degree of vacillation by the students concerning the "strength" of their generally positive images. For the most part, however, the findings are consistent.

Component 2 has been designated as a "knowledge" dimension because it consists of all the "knowledge" statements and no others. Hence, it seems that students possess relatively similar ideas about what subject matter geography is concerned with. Despite the apparent homogeneity of variables within this component, it only managed to account for some 6.5 percent of the variance in the data matrix. Therefore, the impression, which could be formed, is that geographic material is perceived as being extremely diverse in content, and consequently of varying interest to different groups of students.

The third component consists of two "teaching" items and one "attitude" item and explains 4.1 percent of the variance in high school images of geography. Both of the teaching statements are strongly favorable to geography, while the attitude statement, indicating goegraphy to be a logical subject, behaves similarly. Component 3 generally reinforces the positive relationship between the content of

geography and the manner in which it is taught, a state of affairs already revealed by component 1. Therefore, components 1 and 3 largely support a favorable high school image of geography.

Component 4 likewise consists of two "teaching" statements and one "attitude" statement, and may be translated as representing another "education-curriculum" factor. Once again, component 4 may be thought of as complementing components 1 and 3. Note, however, that it only explains some 3.7 percent of the common variation in the data. Finally, component 5 could possibly be construed as an "ecology" dimension.

CONCLUSIONS

The intent of this paper was to measure the images which high school students in Nebraska have about geography. A Likert-type schedule containing thirty statements relating to geography was used as a means of collecting raw data on the students' opinions. These data were then subjected to a principal components analysis in an effort to extract meaningful dimensions underlying the students' images of geography. It was anticipated that such an analysis may have yielded three components, namely, a "knowledge", a "teaching", and an "attitude" component. Instead, five dimensions were revealed, and only one of them, the "knowledge" factor, accorded with the authors' expectations. However, three of the remaining four components (1, 3, and 4) indicated a fairly intimate relationship existed between the actual subject matter of geography and the effectiveness of high school teachers. Consequently, they all suggest a link between educational methods and the geographic curricula itself, and were therefore referred to as "education-curriculum" components.

A problem with these components, however, was that, with the exception of component 1, they each accounted for only a modest proportion of the variance in the image data. Moreover, it would have been desirable had the five dimensions been able to account for a substantially greater share of the variance than the

47.5 percent they achieved. This suggests that high school images of geography, while they can be tentatively identified as being positive, nevertheless appear to be rather weakly formulated. This in turn implies that further research is needed in this area, and that perhaps additional effort is required to convey the impression of a coherent geographic discipline.

NOTES

1. For an appraisal of the critical implications of such comments for the geographical community, see J. W. R. Whitehand, "The Fault, Dear Brutus, is... in ourselves..", Area, 9 (1977), pp. 225-228.

2. J. Thomas Hastings, J. L. Wardrop, and D. Gooler, "Evaluating Geography Courses: A Model with Illustrative Applications," Commission on College Geography, Technical Paper Number 3, (Washington, D.C.: Association of American Geographers, 1970).

3. Ibid., p. 31.

4. R. J. B. Carswell, "Evaluation of Affective Learning in Geographic Education," in D. G. Kurfman, ed., Evaluation in Geographic Education, The 1971 Yearbook of the National Council for Geographic Education (Belmont, California: Fearon Publishers, 1970), pp. 108-09.

5. R. Likert, "A Technique for the Measurement of Attitudes," Archives of Psychology, 140 (1932), pp. 44-53.

6. R. J. B. Carswell, op. cit., p. 111.

7. N. A. Bengston, "High School Geography -- To Be or Not to Be," School Science and Mathematics, 29 (1929), pp. 693-701; K. J. Williams, "A Survey of the Knowledge of Incoming Students in College Geography," Journal of Geography, 51 (1952), pp. 157-162.

8. N. A. Bengston, op. cit., pp. 693-701

9. K. J. Williams, op. cit., pp. 157-62.

10. P. Bacon, "An Introduction to Geography in the Curriculum," in W. Hill, ed., Curriculum Guide for Geographic Education, (Normal, Illinois: National Council for Geographic Education, 1964), p. 8.

11. See, for example, N. Helburn, "The Educational Objectives of High School Geography," Journal of Geography, 67 (1968), p. 275. See also, W.D. Pattison, "The Educational Purposes of Geography," in D. G. Kurfman, ed., Evaluation in Geographic Education, op. cit., p. 19.

12. N. Helburn, op. cit., p. 275. See also, S. Wood, "An Evaluation of Achievement Tests in Geography," in D. G. Kurfman, ed., Evaluation in Geographic Education, op. cit., p. 136.

13. D. G. Kurfman, "Evaluation Developments Useful in Geographic Education," in D. G. Kurfman, Evaluation in Geographic Education, op. cit., pp. 4-5.

14. R. J. B. Carswell, op. cit., p. 116.

15. N. Helburn, op. cit., pp. 280-81.

16. For example, "...geography in the school curriculum is a major source of the child's acquisition of tools and skills that will help him get at world understanding," from P. Bacon, op. cit., p. 8. Also see, H. T. Warman, "New Goals in Geographic Education," Social Education, 26 (1962), p. 198.

17. See, for example, R. C. Anderson, "High School Geography: Retrospect and Prospec," Journal of Geography, 65 (1966), pp. 103-08; N. Bengston, "Geography as an Element in General Education," Journal of Geography, 57 (1958), pp. 121-131; H. Zadanowski, "Geographic Awareness of Eleventh Grade U.S. History Students," Journal of Geography, 69 (1970), pp. 475-479.

18. Twelve scores lie between 3.00 and 3.50.

19. A minimum value of 1.00 for an eiepuvalue is arbitrarily recognized by many as indicating the significance of a component.